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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/658,105

09/09/2003

James E. Toney

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12/14/2004

DINSMORE & SHOHL LLP

Suite 500

One Dayton Centre

Dayton, OH 45402-2023

EXAMINER

CHOI, WILLIAM C

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/658,105

Applicant(s)

TONEY, JAMES E.

Examiner

William C. Choi

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-30, 33-43, 46 and 50-57 is/are pending in the application.
- 4a) Of the above claim(s) 50-57 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3-5, 8-30 and 33-43 is/are allowed.
- 6) ☒ Claim(s) 2 and 46 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. <u>1204</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                              |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1203 &amp; 0304</u> | 6) <input type="checkbox"/> Other: _____   |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of Group 1 (claims 1-30, 33-43 and 46) in the reply filed on 9/28/2004 is acknowledged, and was confirmed as an election without traverse in the telephone interview on 11/30/2004.

### ***Priority***

Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged.

### ***Information Disclosure Statement***

Receipt of the Information Disclosure Statements (IDS's) with the copies of the references cited therein, were received on 12/9/2003 and 3/11/2004. Initialized copies of the IDS's are enclosed with this office action.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2 and 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Claus et al (U.S. 2003/0056546 A1).

In regard to claim 2, Claus discloses an optical heterostructure (page 3, section [0037], Figure 3B) comprising: a matrix having an index of refraction (page 3, section [0037], lines 1-7, Figure 3B, "32"); a first bandgap region defined in said matrix (page 3, section [0037], lines 5-7, Figure 3, "PBG1"); and a second bandgap region defined in said matrix (page 3, section [0037], lines 5-7, Figure 3, "PBG2"), wherein said first and second bandgap regions alternate in succession (Figure 3B, "PBG1, PBG2") along a primary dimension of optical propagation of said heterostructure device (Figure 5), said first and second bandgap regions further alternate along a dimension orthogonal to said primary dimension of optical propagation of said heterostructure device (Figure 3B, "PBG1, PBG2"), said first bandgap region is characterized by a periodic arrangement of first inclusions in said matrix (page 3, section [0037], lines 5-9, Figure 3B, "PBG1, 34"), said periodic arrangement of said first inclusions in said matrix define a first optical bandgap of said optical heterostructure (page 3, section [0037], lines 5-9, Figure 3B, "PBG1"), said second bandgap region is characterized by a periodic arrangement of second inclusions in said matrix (page 3, section [0037], lines 5-7 & 9-10, Figure 3B, "PBG2, 36"), said periodic arrangement of said second inclusions in said matrix define a second optical bandgap of said optical heterostructure (page 3, section [0037], lines 5-7 & 9-10, Figure 3B, "PBG2"), said first and second inclusions have an index of refraction substantially different than said index of refraction of said matrix (page 3, section [0037], lines 11-21), said first optical bandgap is centered at a different wavelength than said

second optical bandgap (page 3, section [0036], last 6 lines), and a transmission bandwidth is defined between said first and second optical bandgaps (page 3, section [0036], last 6 lines).

In regard to claim 46, Claus discloses an optical device comprising components configured to function as a multiplexer (page 1, section [0003]), wherein said optical device employs at least one optical heterostructure comprising: a matrix having an index of refraction (page 3, section [0037], lines 1-7, Figure 3B, "32"); a first bandgap region defined in said matrix (page 3, section [0037], lines 5-7, Figure 3, "PBG1"); and a second bandgap region defined in said matrix (page 3, section [0037], lines 5-7, Figure 3, "PBG2"), wherein said first bandgap region is characterized by a periodic arrangement of first inclusions in said matrix (page 3, section [0037], lines 5-9, Figure 3B, "PBG1, 34"), said periodic arrangement of said first inclusions in said matrix define a first optical bandgap of said optical heterostructure (page 3, section [0037], lines 5-9, Figure 3B, "PBG1"), said second bandgap region is characterized by a periodic arrangement of second inclusions in said matrix (page 3, section [0037], lines 5-7 & 9-10, Figure 3B, "PBG2, 36"), said first and second inclusions have an index of refraction substantially different than said index of refraction of said matrix (page 3, section [0037], lines 11-21), said periodic arrangement of said second inclusions in said matrix define a second optical bandgap of said optical heterostructure (page 3, section [0037], lines 5-7 & 9-10, Figure 3B, "PBG2"), said first optical bandgap is centered at a different wavelength than said second optical bandgap (page 3, section [0036], last 6 lines), and

a transmission bandwidth is defined between said first and second optical bandgaps (page 3, section [0036], last 6 lines).

***Allowable Subject Matter***

Claims 1, 3-5, 8-30 and 33-43 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 1, 3-5 and 8-30: an optical heterostructure comprising a matrix and first and second bandgap regions defined by respective periodic arrangements of inclusions as claimed, specifically wherein said first and second bandgap regions alternate in succession along a primary dimension of optical propagation of said heterostructure device to define a succession including at least one bandgap region of said first type interposed between a pair of bandgap regions of said second type.

The prior art fails to teach a combination of all the claimed features as presented in claims 33-43: an optical waveguide comprising a core and a boundary region having substantially different indices of refraction wherein said core region defines a primary dimension of optical propagation and is bounded by said boundary region as claimed, specifically wherein said core region defines a heterostructure region comprises a first and second bandgap region defined in a matrix and are characterized by periodic arrangements of first and second inclusions respectively in said matrix.

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 6: an optical heterostructure comprising a matrix and first and second bandgap regions defined by respective periodic arrangements of inclusions as claimed, specifically wherein said first and second bandgap regions alternate along a primary dimension of optical propagation of said heterostructure device to define a plurality of first bandgap regions and a plurality of second bandgap regions.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W.C.  
William Choi  
Patent Examiner  
Art Unit 2873  
December 6, 2004

  
Georgia Epps  
Supervisory Patent Examiner  
Technology Center 2800